

## INTESTINAL ANASTOMOSIS BY INVAGINATION.

BY A. ERNEST MAYLARD, M.B., B.S. (Lond.),

OF GLASGOW,

Surgeon to the Victoria Infirmary, Glasgow; Late Examiner in Surgery to the Victoria University, Manchester, and to the University of Glasgow.

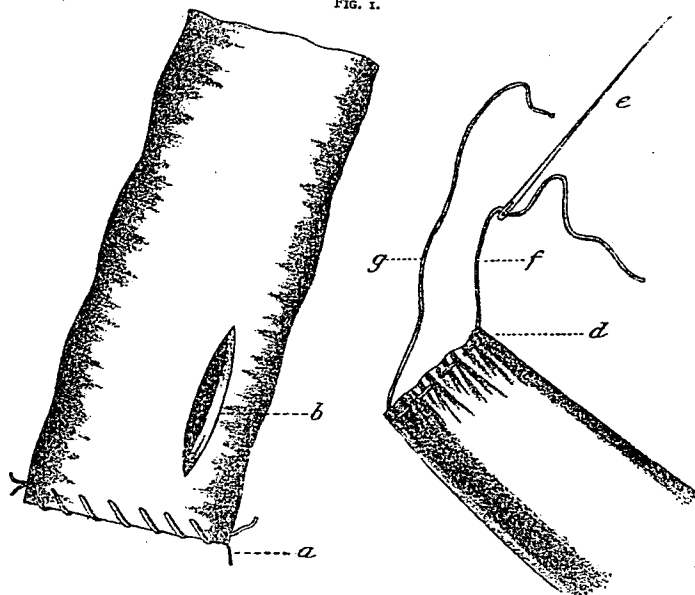
ANY detail in the performance of an operation that will lessen the period of its execution may be justly regarded as a distinct advantage. This reasoning applies, perhaps, with greater force to the abdominal cavity than to any other part of the body; for it is universally conceded that risks of shock and infection bear a direct ratio to the length of time during which the intra-abdominal organs are unnaturally exposed to mechanical or chemical irritation.

The particular detail which it is the object of this short communication to promulgate refers to a simple method of anastomosing one segment of the intestinal canal with another. It was the desire to execute an anastomosis in as short a time as possible that led me to adopt the method in the first instance; and its ease in performance and success induced me to use it subsequently. I have now performed it in four cases, and in each with the result of obtaining perfect union. In two cases, the invagination was of the ileum into the ascending colon; in one, of the ileum into the descending colon; and in one, of the colon into the colon.

A glance at the diagrammatic illustrations will at once make clear the procedure adopted. Suppose the case be one of excision of the cæcum. After removal of the diseased part, the proximal patent end of the ascending colon is stitched up and withdrawn enough to permit a longitudinal incision of sufficient length to be made through the parietes slightly above the occluded end. The length of the incision will be determined by the size of the ileum, which, in cases of obstruction, may be much dilated and hypertrophied. A large-eyed needle threaded with a silk suture about 18 inches in length is car-

ried some three or four times across the patent orifice of the ileum as if to occlude it. The free end of the suture, which was left long, is then passed through the eye of the needle, so that the ileum is now secured as by a sling. The needle is next passed into the colon through the previously made in-

FIG. 1.

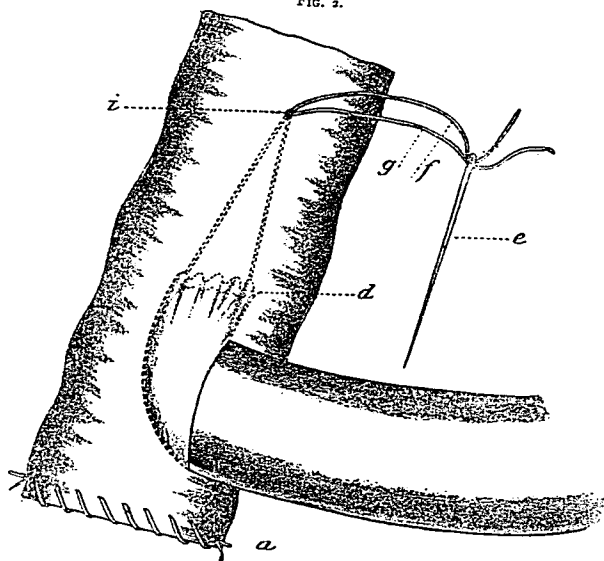


Anastomosis by invagination. 1st stage.—*a*, end of distal segment of bowel occluded by continuous suture; *b*, incision into distal segment; *d*, end of proximal segment of bowel secured with suture, one end of which is left long for rethreading and the other threaded into the needle *e*.

cision, and directed up the intestinal canal for about two inches, when it is made to penetrate the bowel wall from within outwards. By pulling out the needle and consequently dragging upon the sling suture, the ileum is—with the aid of a little guiding—drawn through the incision and made to pass for a short distance along the canal of the colon. While

an assistant keeps tension upon the sling, the operator commences to fix the ileum to the colon by a series of interrupted Lembert sutures passed around the circumference of the opening of the colon. The needle is unthreaded; and by pulling upon one end of the sling suture the other is drawn out of the ileum, the orifice of the latter being thus left free to open

FIG. 2.



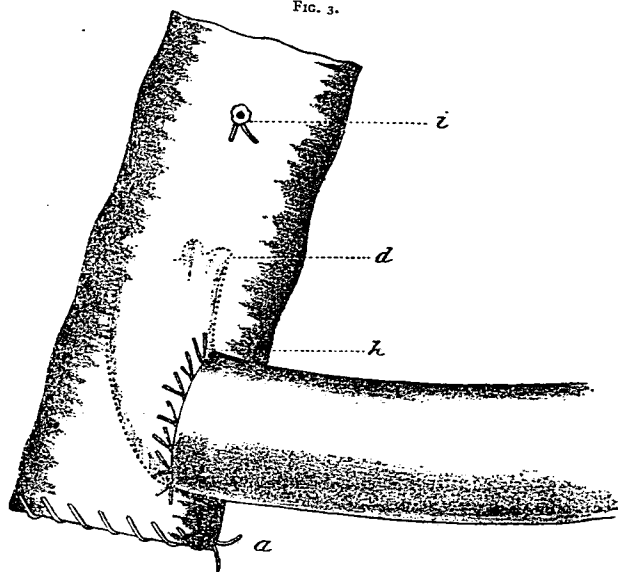
Anastomosis by invagination. 2nd stage.—Shows proximal segment invaginated into distal segment through the opening *b* in Fig. 1, by means of sling suture *g, f*. The needle *e* has been made to perforate the bowel at *i* by passing from within outwards.

out. It only remains for security's sake to tie a ligature around the puncture in the colon through which the needle and suture passed.

The last case in which I adopted this method with complete success was that of a woman who had advanced malignant disease of the splenic flexure of the colon, which also invaded the stomach. The patient suffered from obstructive

symptoms; and as removal of the disease was out of the question, I divided the transverse colon just anterior to the disease and planted the patent proximal end into the descending colon. In this instance a small detail in the process of invagination was requisite which it was not necessary to

FIG. 3.



Anastomosis by invagination, 3rd stage.—Shows operation completed. *h*, single circle of interrupted Lembert sutures; *i*, needle puncture surrounded by purse-string suture; *a* and *d*, as in Fig. 1.

execute in planting the ileum into the colon. The mesentery is a thinner and more delicate membrane than the mesocolon, so that it can be sufficiently drawn in when traction is made upon the small bowel. But the comparative bulkiness of the mesocolon necessitates that about an inch or so of this structure be tied off before a sufficient length of bowel can be properly invaginated.

In most methods of anastomosis where the line of union is usually between two raw edges, it is considered advisable, for the sake of absolute security, to employ a double row of sutures—an inner, which unites the free margins of the applied bowel orifices; and an outer, which more or less doubles in and covers the inner series. In the present method there is only the free margin of one orifice, and this is united to the intact walls of the invaginated bowel, so that the line of sutures corresponds to the outer series employed in the ordinary methods. Further, it may be said that there is no need for more than this single series because the mechanics of the anastomosis is different. Where the free edges of the bowel orifices are united together there is liable to be distention with consequent tension, and the possibility of leakage if a double series of sutures be not employed. In invagination, however, the unimpaired continuity of the bowel wall as it passes through the colonic aperture allows of the contents of the proximal segment to be well and freely propelled into the canal of the distal segment with little or no obstruction at the line of suture, and, therefore, with practically no possibility of leakage.

As regards the after-advantage of invagination it is probable that nothing of the nature of contraction, much less of occlusion, will take place at the opening into the colon. This untoward result is always a possibility where the raw edges of the two bowel orifices are united together.

What is the future fate of that portion of the bowel which has been drawn into the canal of the distal segment it is not possible to say. One might conjecture that it would shrink to some extent; and one might still further venture on the assumption that it acted somewhat like a valve, preventing any backward flow or regurgitation from the distal segment into the proximal. If so, then in cases where the cæcum has been excised, the operation artificially reproduces what nature ordained should exist in the form of the ileocæcal valve, but which disease and surgical intervention had removed. The entrance into what may more properly be regarded as specu-

lative considerations concerning the advantages of the method must not blind us to the possibilities of untoward results. Thus the invaginated segment of gut might lead to intussusception, just as is known to happen in cases where there exists a free Meckel's diverticulum. The analogy, however, is not complete; and the risk may be reasonably regarded as too slight in view of the other obvious advantages of the method.